



CLARA



CLARA ED 28LED

The LED Engine is designed to meet the demands from high volume producers and is easily connected to an external driver. Integrated high output optics are suited to support the light outputs for particular applications such as Downlights, Spotlights, Tasklights, Examination Lights etc.



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Datasheet Clara ED.12.700.28.zyy-130

Author:
SL

Date:
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Introduction

Applications

The LED module and light engine is named Clara and it is a design for light fittings and luminaires aiming for various areas. It has been designed in order to meet the demands on high performance optical solutions in both light emitting and in colour rendering. Mechanically it is constructed with our package design Clara (~50 mm) that has the same footprint as the others in the family both for external drivers as well as for built-in drivers or 110/230VAC.

Clara package

The same package is used for Downlight, Spotlight, Tasklight and Medical light fittings etc. The solution is developed to make it easy for the designers and engineers to choose from low to high power, from AC to DC and choose between a variety of lenses in the same luminaire or in similar designs. In the design concept there are standard dimmers with the same snap-in connector (that fits the whole Optodrive™ concept) as well as several heat sink designs with worldwide distribution.

ED design

ED stands for “External driver”. It has a standard plug-in connector that fits all the different ED platforms (e.g. Felicia, Steffi, Clara and Svea etc).

Light output

The colour stability is of high importance in order to ensure that the installations have a uniform light output. Parameters such as binning, lifetime and thermal control are vital for good results.

Technical attributes

- Energy saving and a high lumen output
- High Colour Rendering
- Uniform Colour temperature
- Controlled lifetime
- Simple integration

Please note that the article number structure for the variations of the modules comes separately.



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Short form Characteristics

Mechanical	
Board dimensions:	48.4 mm diameter
Assembly holes:	2 x 3.8 mm
Wire Connector:	PHR-2 or equivalent
Height:	13.6 mm

Electrical	
Number of LED's:	28
Power supply	External driver
Input Voltage	12.5V
Power:	9W
Module current:	Typical 700mA (Max 1050mA)

Light	
CCT:	2700K / 3000K / 4000K
CRI:	> 80 Ra / >90 Ra
Light output:	
SDCM (Mac Adam)	4

Environmental operation conditions:	
Temperature range:	-40°C to 65°C (Absolute maximum temp Tc 65°C)
Relative Humidity:	10-75%
Ambient air pressure:	500-1060 HPa



Article number structure

Optodrive™ Article Number consists of two parts:

- 1st part: Module Number
- 2nd part: Bin Code or Rank

Article number: Clara ED.12.700.28.840-NN	
Clara:	Module name
ED:	External drive
P:	Power (Watt) maximum 12W
mA:	mA that the module are binned at.
n:	Amount of LEDs
8:	CRI >90
Yy:	CCT 27 =2700K, 30 =3000K, 40 =4000K
N:	Viewing angle code 130 for 130°

Clara ED

Module name	Power supply	Watt	mA	LED	CRI Ra	CCT Kelvin	Lens angle	Article name
Clara	ED	9	700	28	80+	2700	130°	Clara ED.12.700.28.827-130
Clara	ED	9	700	28	90+	2700	130°	Clara ED.12.700.28.927-130
Clara	ED	9	700	28	80+	3000	130°	Clara ED.12.700.28.830-130
Clara	ED	9	700	28	90+	3000	130°	Clara ED.12.700.28.930-130
Clara	ED	9	700	28	80+	4000	130°	Clara ED.12.700.28.840-130
Clara	ED	9	700	28	90+	4000	130°	Clara ED.12.700.28.940-130

Wire order information:

Article number	Article name	Length
103481	Wire ED L 200	200mm
103323	Wire ED L 325	325mm





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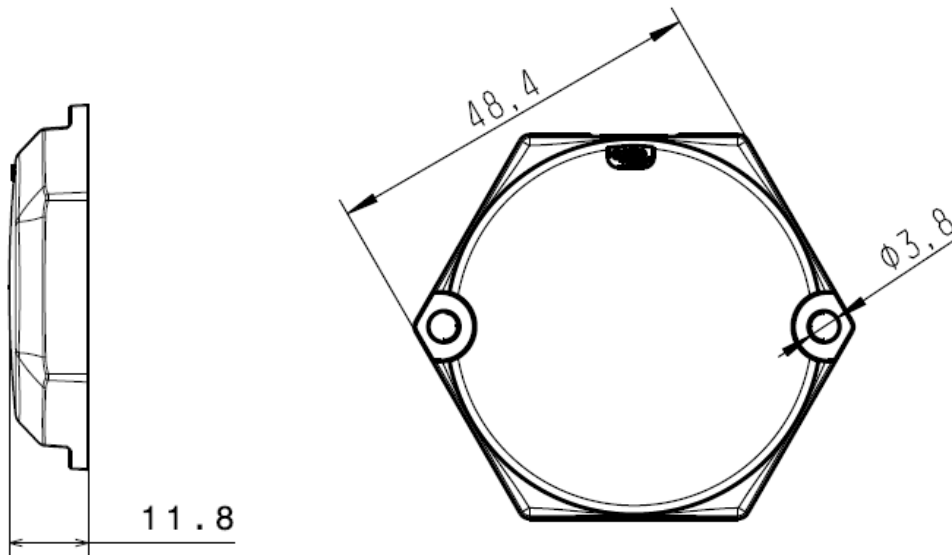
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Dimensions LED Module:





Parameters of the Lens system

The lens system is mounted and fixated onto the PCB with a double press-fit. The light parameters are according to the following:

Version	Viewing Angle	FWHM Angle
Clara Cover	130°	±65°

Versions that are under development

Lens material optical grade PMMA.

- Allows use of high current and temperature conditions
- Best available optical efficiency with up to 90%
- Very even colour distribution over the whole beam angle
- Integrated holder. Fastening to heat sink with two screws
- Compact dimensions



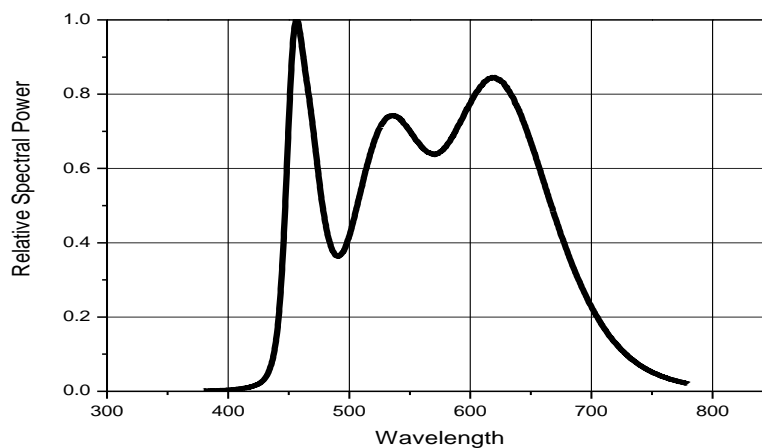
Parameters of the light output

White 4000K

	Symbol	Value ⁽⁴⁾			Unit
		Min	Typ	Max	
Clara ED.12.700.28.840-130 ⁽¹⁾⁽²⁾⁽³⁾					
Luminous Flux	Φ_v	690	-	750	lm
Correlated Colour Temperature	CCT		4000		K
CRI	R_a	80	-	-	-
Power	Po		9		W

	Symbol	Value ⁽⁴⁾			Unit
		Min	Typ	Max	
Clara ED.12.700.28.940-130 ⁽¹⁾⁽²⁾⁽³⁾					
Luminous Flux	Φ_v	650	-	750	lm
Correlated Colour Temperature	CCT		4000		K
CRI	R_a	90	-	-	-
Power	Po		9		W

- (1) See detailed information in chapter "Parameter of lens system" Replace NN with viewing angle accordingly
- (2) See detailed information in chapter "Luminous Flux Bin" Mark the minimum intensity code
- (3) See detailed information in chapter "Binning structure graphical representation" Mark the colour shortform letter.
- (4) Electro-Optical characteristics LED at $I_f=700\text{mA}$, $T_c=25^\circ\text{C}$



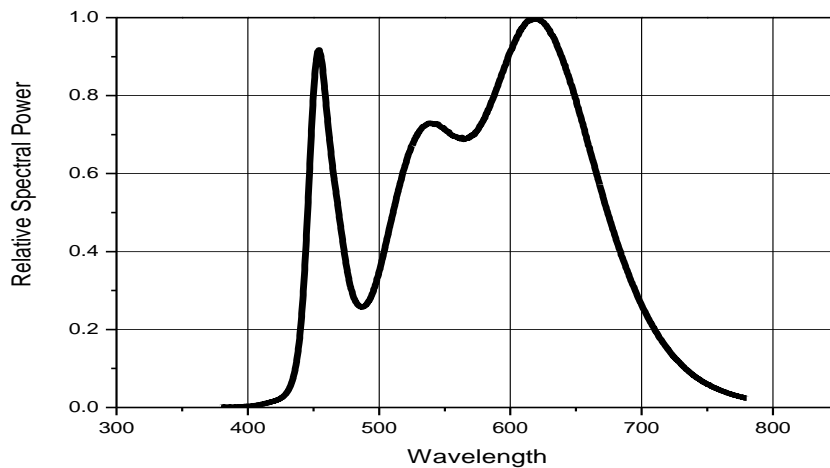


Warm White 3000K

	Symbol	Value ⁽⁴⁾			Unit
		Min	Typ	Max	
Clara ED.12.700.28.830-130 ⁽¹⁾⁽²⁾⁽³⁾					
Luminous Flux	Φ_V	650	-	725	lm
Correlated Colour Temperature	CCT		3000		K
CRI	R_a	80	-	-	-
Power	P_o		9		W

	Symbol	Value ⁽⁴⁾			Unit
		Min	Typ	Max	
Clara ED.12.700.28.930-130 ⁽¹⁾⁽²⁾⁽³⁾					
Luminous Flux	Φ_V	615	-	690	lm
Correlated Colour Temperature	CCT		3000		K
CRI	R_a	90	-	-	-
Power	P_o		9		W

- (1)See detailed information in chapter "Parameter of lens system" Replace NN with viewing angle accordingly
- (2)See detailed information in chapter "Luminous Flux Bin" Mark the minimum intensity code
- (3)See detailed information in chapter "Binning structure graphical representation" Mark the colour shortform letter.
- (4)Electro-Optical characteristics LED at $I_F=700mA$, $T_c=25^\circ C$



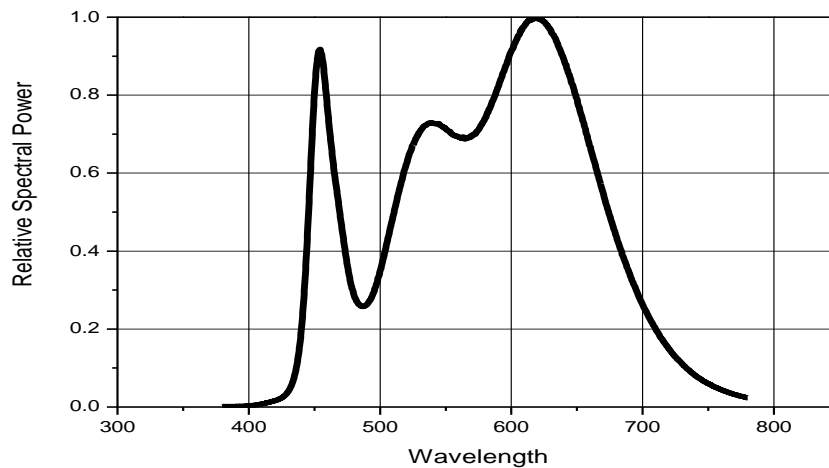


Warm White 2700K

Clara ED.12.700.28.827-130 ⁽¹⁾⁽²⁾⁽³⁾					
	Symbol	Value ⁽⁴⁾			Unit
		Min	Typ	Max	
Luminous Flux	Φ_V	650	-	725	lm
Correlated Colour Temperature	CCT		2700		K
CRI	R_a	80	-	-	-
Power	P_o		9		W

Clara ED.12.700.28.927-130 ⁽¹⁾⁽²⁾⁽³⁾					
	Symbol	Value ⁽⁴⁾			Unit
		Min	Typ	Max	
Luminous Flux	Φ_V	615	-	690	lm
Correlated Colour Temperature	CCT		2700		K
CRI	R_a	90	-	-	-
Power	P_o		9		W

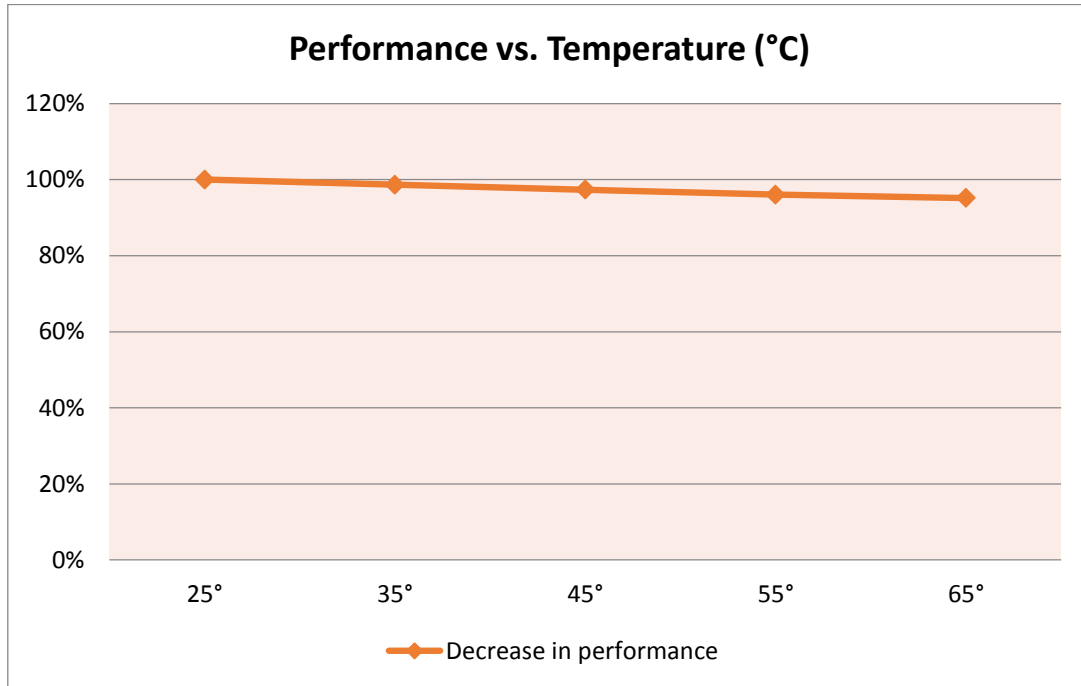
- (1)See detailed information in chapter "Parameter of lens system" Replace NN with viewing angle accordingly
- (2)See detailed information in chapter "Luminous Flux Bin" Mark the minimum intensity code
- (3)See detailed information in chapter "Binning structure graphical representation" Mark the colour shortform letter.
- (4)Electro-Optical characteristics LED at $I_f=700mA$, $T_c=25^\circ C$





Electro Optical data

Temperature Characteristics



Consider the thermal capabilities of where the LED module is to be fitted. The temperature is an important factor for light output as well as for long time light output degradation.

Thermal information

the thermal area (green) has to be properly connected to an even and fine surface of a heat sink. Without this arrangement the unit will be overheated and will not be able to survive.



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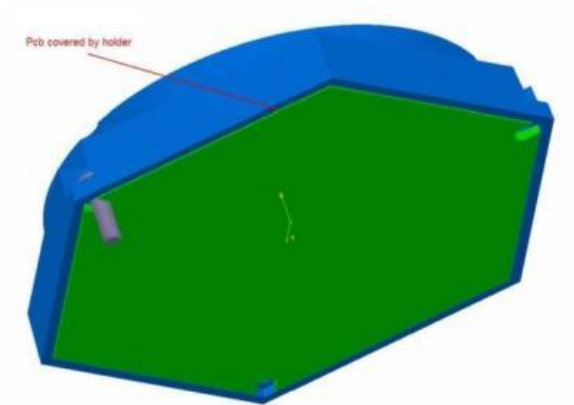
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Maximum Temperature

Secure the temperature in your application not to exceed 65°C. Read more in the section on how to measure temperatures.





Binning and Labeling

Article number: Clara ED.12.700.28 zyy-130

Bin code: :x¹.x².x³

Colour Rendering Index (CRI)

Intensity Code (z)	CRI (min) Ra
7	70
8	80
9	90

Short form letters for CCT

Colour Code (yy)	CCT
27	2700K
30	3000K
40	4000K

Luminous Flux Bins at 700mA, Tc=25°C

Intensity Code: x ²	Lumen output (lm)
3	650
4	670
5	690
6	725
7	750
8	800
9	840

Forward Voltage Bins at 700mA, Tc=25°C

Vf: x ³	Vf min (V)	Vf max (V)
2	11.6	12.0
3	12.0	12.4
4	12.4	12.8
5	12.8	13.2
6	13.2	13.6
7	13.6	14.0

Measurement Control

The recommended maximum value is 65°C on Tc or measuring point. If this value is exceeded we cannot guarantee the function and the lifetime of the product. The purpose of the measurement is to control the Junction (Tj) temperature of the LED and also in order to control the performance on the complete setup. By measuring the junction temperature (Tj) the average lifetime of the product is known.

The thermal connection is measured in temperature vs. Power.

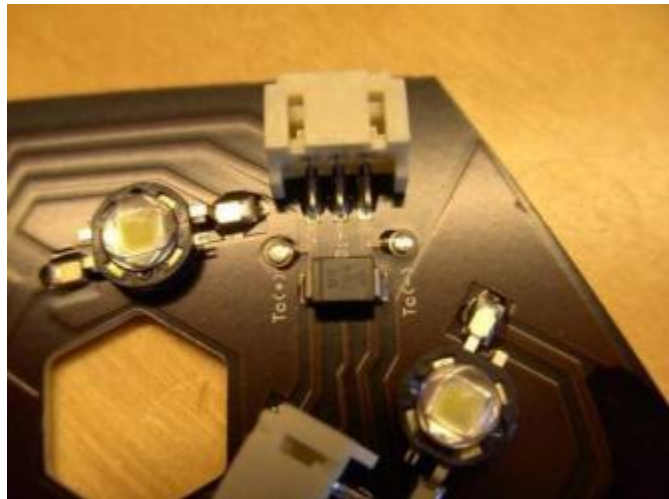
Measurement points

When the measurement takes place you verify that the temperature on the marked measurement points are satisfying. Pending on the result you know what lifetime to expect from the module.

Measurement points

- TC

This step will be implemented after the heat sink has been connected properly!





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Lifetime (Calculated)

The lifetime is calculated at the maximum temperature recommended at the Tc (measuring point). It is important not to exceed this recommendation; you find more information under the chapter “measurement control”.

Unit	Tc Maximum	50% degradation <i>L</i> ₅₀	30% degradation <i>L</i> ₇₀
Clara (700mA)	65° C	>50 000 hours	>50 000 Hours



Precautions for use

- This device should not be used in any type of fluids such as water, oil, organic solvent etc.
- When cleaning is required, use only water together with mild soap on the outside of the lens. Cleaning inside of the LED module is strictly prohibited.
- The appearance and specifications of the product may be modified for improvement without notice.
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- Opening of the LED module is prohibited due to risk of EMC, dust, grease and other exposures that will damage it.
- The LED Module should always be mounted to a proper heat sink before it's connected with its proper leads. This is due to electrical hazard.

ROHS Compliant

All our LED modules meet the Restrictions of Hazardous Substances (RoHS)!

There has been a growing consensus that Lead Free Systems should increase for the safety of our environment. It is a very serious problem that lead and other harmful materials are being used in commercial and industrial products, causing more and more environmental problems. This has led to regulations such as RoHS (Restriction of the use of certain Hazardous Substances) from the EU and the Japan Ministry of Trade and Industry (MITI). All LED module makers providing products to these countries should comply with these restrictions. In order to meet the RoHS regulation, Optoga is strictly implementing a ban on lead and other hazardous materials in its products. This is in compliance with our responsibilities as good corporate citizens.

Design for Environment:

According to the EU-directive 2002/95/EC (RoHS) the following substances must not be used in this product

- Lead (Pb) alloys
- Mercury (Hg)
- Cadmium (Cd)
- Chromium (6+) compounds

Do you want to know more about the benefits of OptoDrive™ LED?

Read more about OptoDrive™ at www.optodrive.se. You can also register your interest via info@optoga.se.

Obviously, you can also call us on +46 (0)589 490 950.

Optoga AB

Founded in November 2004, Optoga has over 30 years of experience in electronic components. The company develops and supplies LEDs, LED drivers, LED modules and software solutions for the lighting industry, vehicle manufacturers and electronics companies.

By developing products with integrated LED and driver electronics, Optoga has taken the initiative to replace strip lights, incandescent and halogen bulbs with LED-based light sources.

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